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(71)Applicant : KOATSU CLOTH KK

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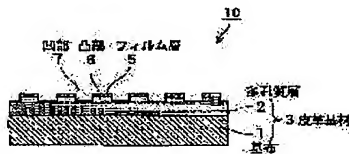
(72)Inventor : KIN HIDESADA

(54) ARTIFICIAL LEATHER, ITS PRODUCTION AND APPARATUS THEREFOR

(57)Abstract:

PURPOSE: To provide an artificial leather having an air-permeability and feeling similar to those of natural leather.

CONSTITUTION: The leather substrate 3 of this artificial leather 10 consists of an air-permeable base cloth 1 composed of a nonwoven fabric interlocked with a polyurethane sponge and an air-permeable porous layer 2 formed on the base cloth 1. A film layer 5 is directly formed on the porous layer 2 without using an adhesive. The porous layer 2 has a leather-like irregular surface and the film layer 5 is formed exclusively on the protruded part 6 of the irregular surface. The obtained artificial leather keeps the air-permeability similar to natural leather since the base cloth 1 and the porous layer 2 are air-permeable and the air-impermeable film layer 5 is absent on the recesses 7 of the irregular surface of the artificial leather 10.



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CLAIMS

[Claim(s)]

[Claim 1] it forms on the base fabric of permeability, and this base fabric -- having -- leather -- the artificial leather characterized by having the leather base material which has the porous layer of the permeability which has a concavo-convex front face [like], and the film layer formed on the heights of the aforementioned concavo-convex front face of the aforementioned porous layer

[Claim 2] Artificial leather according to claim 1 characterized by for the nonwoven fabric around which polyurethane sponge was twined having constituted the aforementioned base fabric, and constituting the aforementioned porous layer and the aforementioned film layer by polyurethane.

[Claim 3] The film material for forming the aforementioned film layer on the transfer paper which has the shape of toothing which reversed the concavo-convex front face [like] is applied. the manufacture method of artificial leather according to claim 1 -- it is -- leather -- By superimposing the aforementioned transfer paper on the application process which fills up the crevice of the shape of aforementioned toothing with the aforementioned film material so that the application side of the aforementioned film material may touch on the aforementioned leather base material, and performing heating and pressurization of the aforementioned leather base material and the aforementioned transfer paper the leather of the aforementioned transfer paper, while carrying out the press imprint of the configuration of a concavo-convex front face [like] on the aforementioned leather base material the aforementioned leather imprinted on the aforementioned leather base material in the aforementioned film material with which the crevice of the shape of toothing of the aforementioned transfer paper was filled up -- the manufacture method of the artificial leather characterized by including the imprint process imprinted on the heights of the configuration of a concavo-convex front face [like]

[Claim 4] The manufacturing installation of the artificial leather for enforcing the manufacture method according to claim 3 characterized by providing the following The roller which has the flexibility which sends out the aforementioned transfer paper The coater which has the blade which fills up the crevice of the shape of aforementioned toothing of the aforementioned imprint with scraping with the aforementioned film material which is pressed by this roller and supplied on the aforementioned transfer paper The main roller which performs heating of the aforementioned leather base material which superimposed the aforementioned transfer paper so that the field which applied the aforementioned film material on the aforementioned leather base material might touch, and the aforementioned transfer paper The auxiliary roller which holds the belt and this belt for carrying out the field press of the aforementioned leather base material and the aforementioned transfer paper at this main roller, and the pressurization roller which performs pressurization of the aforementioned leather base material and the aforementioned transfer paper between the aforementioned main rollers

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the artificial leather which has the same permeability and same feeling as a natural leather, its manufacture method, and a manufacturing installation.

[0002]

[Description of the Prior Art] Before, since the natural-leather product is expensive, development of the artificial leather which replaces this is performed briskly. However, the actual condition is that the artificial leather which has the same feeling and same permeability as a natural leather is not yet developed.

[0003] Drawing 4 has illustrated the cross-section composition of conventional artificial leather. this artificial leather 30 is formed on the base fabric 31 of permeability, and a base fabric 31 -- having -- leather -- it has the leather base material 33 constituted by the porous layer 32 of the permeability which has a concavo-convex front face [like] on the leather base material 33, the film layer 35 which contains urethane resin through a glue line 34 carries out a laminating -- having -- the film layer 35 -- leather -- the concavo-convex front face [like] is formed

[0004] Such artificial leather 30 is manufactured by the manufacture method shown in drawing 5 (a) - (c). That is, the film material 38 used as the film layer 35 is supplied on the transfer paper 39 sent out with the metal roller 36. a transfer paper 39 -- leather -- it has the shape of toothing which reversed the concavo-convex front face [like] A predetermined interval is vacated on a roller 36, a blade 37 is formed, and the film material 38 is applied by this blade 37 on a transfer paper 39. by drying this shows to this drawing (b) -- as -- a transfer-paper 39 top -- leather -- the film layer 35 which has the shape of toothing [like] is obtained Next, as adhesives 34 are applied on the film layer 35 and it is shown in this drawing (c), it is superimposed so that these adhesives 34 may touch on the porous layer 32 of the leather base material 33, and the artificial leather 30 of drawing 4 is obtained by exfoliating a transfer paper 39.

[0005]

[Problem(s) to be Solved by the Invention] In the artificial leather shown in drawing 4 , since adhesives 34 and the film layer 35 do not have permeability, when it is used as shoes etc., they have the trouble of being steamed as compared with a natural leather.

[0006] Moreover, the main component of the film layer 35 has the trouble that it is hard since it is a urethane resin, and soft feeling like a natural leather is not obtained.

[0007] Accomplished in order that this invention may solve the trouble of such conventional technology, the purpose of this invention is offering the artificial leather which has the same permeability and same feeling as a natural leather. Moreover, other purposes of this invention are offering the manufacture method and manufacturing installation.

[0008]

[Means for Solving the Problem] the artificial leather of this invention is formed on the base fabric of permeability, and this base fabric -- having -- leather -- it is characterized by having the leather base

material which has the porous layer of the permeability which has a concavo-convex front face [like], and the film layer formed on the heights of the aforementioned concavo-convex front face of the aforementioned porous layer

[0009] Moreover, the nonwoven fabric around which polyurethane sponge was twined may constitute the aforementioned base fabric, and polyurethane may constitute the aforementioned porous layer and the aforementioned film layer.

[0010] The film material for forming the aforementioned film layer on the transfer paper which has the shape of toothing which reversed the concavo-convex front face [like] is applied. the manufacture method of the artificial leather of the above [the manufacture method of the artificial leather of this invention] -- it is -- leather -- By superimposing the aforementioned transfer paper on the application process which fills up the crevice of the shape of aforementioned toothing with the aforementioned film material so that the application side of the aforementioned film material may touch on the aforementioned leather base material, and performing heating and pressurization of the aforementioned leather base material and the aforementioned transfer paper the leather of the aforementioned transfer paper -- the aforementioned leather imprinted on the aforementioned leather base material in the aforementioned film material with which the crevice of the shape of toothing of the aforementioned transfer paper was filled up while carrying out the press imprint of the configuration of a concavo-convex front face [like] on the aforementioned leather base material -- it is characterized by including the imprint process imprinted on the heights of the configuration of a concavo-convex front face [like] [0011] The roller which has the flexibility which the manufacturing installation of the artificial leather of this invention is a manufacturing installation of the artificial leather for enforcing the above-mentioned manufacture method, and sends out the aforementioned transfer paper, The coater which has the blade which fills up the crevice of the shape of aforementioned toothing of the aforementioned imprint with scraping with the aforementioned film material which is pressed by this roller and supplied on the aforementioned transfer paper, The main roller which performs heating of the aforementioned leather base material which superimposed the aforementioned transfer paper so that the field which applied the aforementioned film material on the aforementioned leather base material might touch, and the aforementioned transfer paper, It is characterized by the imprint equipment and the thing which have an auxiliary roller holding the belt and this belt for carrying out the field press of the aforementioned leather base material and the aforementioned transfer paper, and the pressurization roller which performs pressurization of the aforementioned leather base material and the aforementioned transfer paper between the aforementioned main rollers on this main roller.

[0012]

[Function] a leather base material consists of artificial leather of this invention by the base fabric of permeability, and the porous layer of permeability -- having -- a porous layer -- leather -- it has a concavo-convex front face [like], and the direct laminating of the film layer is carried out only to the heights of this concavo-convex front face through adhesives That is, since the film layer which the layer of adhesives without permeability does not exist in the front face of the leather base material of permeability, and does not have permeability is not wearing the whole surface of the leather base material of permeability, the same permeability as a natural leather is maintained. In addition, since it is not necessary to form a film layer the whole surface on a leather base material like before and film layer thickness can moreover be made small, the artificial leather obtained does not become hard, the softness of a leather base material is not spoiled to bending, but the soft feeling near a natural leather can be obtained. Furthermore, since the artificial leather of this invention has the film layer, intensity is raised only as compared with the artificial leather which printed to the leather base material.

[0013] Moreover, the feeling still near a natural leather can be obtained by constituting a base fabric from a nonwoven fabric around which polyurethane sponge was twined, and constituting a porous layer and a film layer from polyurethane.

[0014] The manufacture method of the artificial leather of this invention is for manufacturing the above-mentioned artificial leather.

[0015] the manufacture method of this invention -- first -- an application process -- setting -- the leather

on a transfer paper -- it fills up with the film material for forming a film layer only in the crevice of the shape of toothing which reversed the concavo-convex front face [like]

[0016] Next, in an imprint process, heating and pressurization of the leather base material and transfer paper which superimposed the transfer paper so that the field which applied film material on the leather base material might touch, and were superimposed in this way are performed. this heating and pressurization operation -- the leather of a transfer paper -- the configuration of a concavo-convex front face [like] is imprinted on a leather base material moreover, the leather with which the film material with which the crevice of the shape of toothing of a transfer paper was filled up was imprinted by this heating and pressurization operation on the leather base material -- it imprints only on the heights of the configuration of a concavo-convex front face [like] without it uses adhesives by such heating and pressurization operation -- a leather base-material top -- leather -- a concavo-convex front face [like] can be formed

[0017] The manufacturing installation of the artificial leather of this invention is for enforcing the manufacture method of the above-mentioned artificial leather. An above-mentioned application process is performed by the coater and an imprint process is performed by imprint equipment. A coater has the blade pressed by the roller which has flexibility, and this roller, and a transfer paper is sent out with this roller. The film material for forming a film layer is supplied on a transfer paper, and a blade scratches this film material, being pressed by the roller. thereby -- film material -- the leather of the front face of a transfer paper -- the crevice of the shape of toothing which reversed the concavo-convex front face [like] is filled up

[0018] It is superimposed on the transfer paper which filled up the toothing-like crevice with film material on a leather base material so that the field which applied film material may touch a leather base material. Imprint equipment has the auxiliary roller and pressurization roller holding the main roller and belt which heat, and this belt, and heating and pressurization of a transfer paper and a leather base material are performed by these rollers and belts. The field press of a transfer paper and the leather base material is carried out at the main roller heated by predetermined temperature with the belt held with the auxiliary roller. thereby -- the leather of a transfer paper -- the shape of toothing [like] is imprinted on the porous layer of a leather base material a transfer paper and a leather base material are further pressurized with a main roller and a pressurization roller -- having -- thereby -- the leather of a transfer paper -- let the imprint of a up to [the porous layer of the shape of toothing / like] be a positive thing Film material is imprinted as a film layer only on the heights of the concavo-convex front face imprinted with it. thus -- without it uses adhesives by using a coater and imprint equipment -- a leather base-material top -- leather -- a concavo-convex front face [like] can be formed

[0019]

[Example] The example of this invention is explained referring to a drawing. Drawing 1 shows the cross-section composition of the artificial leather of this example. The artificial leather 10 of this example has the leather base material 3, and the leather base material 3 is constituted by the base fabric 1 of the permeability which consists of a nonwoven fabric around which polyurethane sponge was twined, and the porous layer 2 of the permeability containing the polyurethane resin formed on the base fabric 1. a porous layer 2 -- leather -- it has a concavo-convex front face [like], and the film layer 5 is formed only on the heights 6 of this concavo-convex front face In the artificial leather 10 of this example, since the base fabric 1 and the porous layer 2 have permeability, and since the film layer 5 without permeability is not formed in the crevice 7 of the concavo-convex front face of artificial leather 10, permeability is kept being the same as that of a natural leather.

[0020] Being able to manufacture the artificial leather 10 of this example by the manufacturing installation which shows outline composition to drawing 2 (a) and (b), drawing 3 (a) and (b) show the manufacture method of the artificial leather 10 carried out by drawing 2 (a) and the manufacturing installation of (b).

[0021] Hereafter, a manufacturing installation and the manufacture method are explained in order of a manufacturing process. The manufacturing installation of this example has imprint equipment 19 shown in the coater 18 shown in drawing 2 (a), and drawing 2 (b). the roller 16 and blade 17 of the product

[coater / 18] made of rubber -- having -- rotation of a roller 16 -- leather -- the transfer paper 9 which has the front face of the shape of toothing which reversed the concavo-convex front face / like / is sent out On a roller 16, the blade 17 is located on both sides of a transfer paper 9, and the film material 15 for forming the film layer 5 is supplied on the transfer paper 9.

[0022] The gap of a blade 17 and a roller 16 is smaller than the thickness of a transfer paper 9, therefore the blade 17 is pressing the transfer paper 9 on a roller 16. In this example, since the rubber which has flexibility is used for the roller 16, if a transfer paper 9 and a roller 16 will be in the state where it was pressed by the blade 17 and dented, therefore a transfer paper 9 is sent out by rotation of a roller 16, the film material 15 will be scratched by the blade 17. Thereby, as shown in drawing 3 (a), only the crevice 14 of the shape of toothing of a transfer paper 9 is filled up with the film material 15.

[0023] The film material 15 usually contains 10 - 30% of resin, 5 - 10% of pigment, and the solvent. Composition of the film material 15 in this example is 5% of pigments, and 75% of solvents polyurethane resin 20%. What mixed the dimethyl HORUMU flax id, a methyl ethyl ketone, and toluene was used for the solvent.

[0024] Next, as shown in drawing 3 (b), it is superimposed on the transfer paper 9 which filled up the crevice 14 with the film material 15 so that an upper field may touch the porous layer 2 of the leather base material 3 in the field which applied the film material 15, i.e., drawing 3 , (a). Thus, the transfer paper 9 and the leather base material 3 which were superimposed are sent to the imprint equipment 19 shown in drawing 2 (b). Imprint equipment 19 has the main roller 11, and can heat the main roller 11 to predetermined temperature. Moreover, imprint equipment 19 has the belt 14 which presses a transfer paper 9 and the leather base material 3 on the main roller 11, and the belt 14 is held with the auxiliary rollers 12a, 12b, and 12c and the pressurization roller 13. The width of face of the main roller 11 and the pressurization roller 13 is about 1.7m. A transfer paper 9 and the leather base material 3 are sent to the pressurization roller 13 side, being supplied between auxiliary roller 12a and the main roller 11, being pressed by the tension of a belt 14 at the main roller 11, and being heated, as shown in drawing 2 (b).

[0025] The pressurization roller 13 is pressed by the pressure of about 6t in the direction of the main roller 11 while it holds a belt 14. this pressure -- the leather of a transfer paper 9 -- the film material 15 is imprinted as a film layer 5 on the heights 6 of the concavo-convex front face where the leather base material 3 was imprinted at the same time the reversed shape of toothing [like] is imprinted by the leather base material 3 Then, the artificial leather 10 of this example is obtained by cooling a transfer paper 9 and the leather base material 3, and removing a transfer paper 9 from the leather base material 3.

[0026] In the artificial leather 10 of this example, since the film layer 5 which the layer of adhesives without permeability does not exist and does not have permeability is not formed in the crevice 7 of the leather base material 3, permeability is kept being the same as that of a natural leather. In addition, since [which contains polyurethane conventionally] it is not necessary to form the stiff film layer 5 the whole surface on the leather base material 3 comparatively and and thickness of the film layer 5 whole can be conventionally made small, the artificial leather 10 obtained cannot become hard, but the feeling near a natural leather can be obtained, and, moreover, reduction of the amount of the polyurethane resin used can also be aimed at.

[0027] moreover -- since the film material 15 is filled up with the manufacturing installation and the manufacture method of artificial leather 10 of this example only into the crevice 14 of the shape of toothing of a transfer paper 9 -- a next imprint process -- ***** heating and pressurization operation -- the leather base-material 3 top -- leather -- while forming a concavo-convex front face [like], the film layer 5 can be formed only on the heights 6 of this concavo-convex front face therefore -- without it uses adhesives -- the leather base-material 3 top -- leather -- a concavo-convex front face [like] can be formed

[0028] In addition, in this example, although the leather base material 3 was used by no processing, it can obtain the artificial leather which has appearance two-tone [still near a natural leather] by giving a ground print beforehand to the leather base material 3.

[0029]

[Effect of the Invention] In the artificial leather of this invention, since a leather base material is constituted by the base fabric of permeability, and the porous layer of permeability and the direct laminating of the film layer is carried out only to the portion of the heights of a concavo-convex front face through adhesives, the same permeability as a natural leather is maintained. Therefore, when the artificial leather of this invention is used for products, such as shoes, the same feeling of use as a natural leather can be obtained.

[0030] In addition, a film layer is not formed the whole surface on a leather base material conventionally, and moreover the artificial leather obtained since the thickness of the whole film layer is small does not become hard, the softness of a leather base material is not spoiled to bending, but the feeling near a natural leather can be obtained.

[0031] moreover, film material fills up only the crevice of the shape of toothing of a transfer paper with the manufacture method of the artificial leather of this invention -- having -- next heating and next pressurization operation -- the leather of a transfer paper -- the configuration of a concavo-convex front face [like] is imprinted on a leather base material, and film material is imprinted for ** by the heights of the concavo-convex front face on a leather base material as a film layer Therefore, according to the manufacture method of this invention, the above-mentioned artificial leather which has the same feeling and same permeability as a natural leather can be obtained at an easy process.

[0032] furthermore, in the manufacturing installation of the artificial leather of this invention, a blade presses on the roller which has flexibility -- having -- film material -- the leather of the front face of a transfer paper -- the crevice of the shape of toothing [like] -- being filled up -- next heating and next pressurization operation -- the leather of a transfer paper -- a film layer can be formed only in the heights of the shape of this toothing while imprinting the shape of toothing [like] to a leather base material Therefore, the artificial leather which has the same feeling and same permeability as a natural leather can be easily manufactured by using the manufacturing installation of this invention.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the cross section of the artificial leather concerning one example of this invention.

[Drawing 2] (a) And (b) is the outline block diagram showing the manufacturing installation for manufacturing the artificial leather of the example of drawing 1 .

[Drawing 3] (a) And (b) is drawing showing the manufacture method enforced with the equipment of drawing 2 .

[Drawing 4] It is the cross section of conventional artificial leather.

[Drawing 5] The outline block diagram showing the manufacturing installation for (a) manufacturing conventional artificial leather, (b), and (c) are drawings showing the manufacture method of conventional artificial leather.

[Description of Notations]

- 1 -- Base fabric
- 2 -- Porous layer
- 3 -- Leather base material
- 5 -- Film layer
- 6 -- Heights
- 7 -- Crevice
- 9 -- Transfer paper
- 10 -- Artificial leather
- 11 -- Main roller
- 12a, 12b, 12c -- Auxiliary roller
- 13 -- Pressurization roller
- 14 -- Belt
- 15 -- Film material
- 16 -- Roller
- 17 -- Blade
- 18 -- Coater
- 19 -- Imprint equipment

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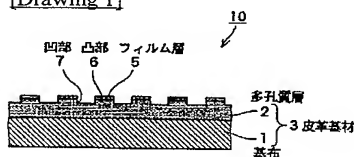
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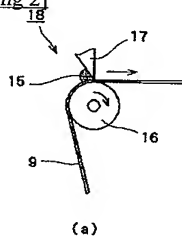
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DRAWINGS

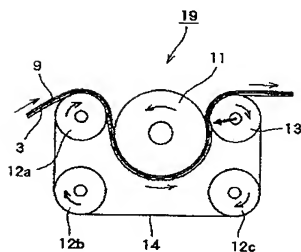
[Drawing 1]



[Drawing 2]

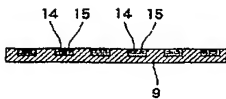


(a)

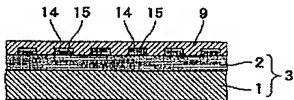


(b)

[Drawing 3]

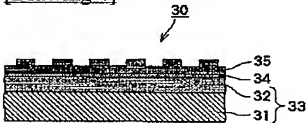


(a)



(b)

[Drawing 4]



[Drawing 5]